

XXXIX. *Observations on the Fossil Insects of Aix in Provence, with Descriptions and Figures of Three Species.* By the Rev. F. W. HOPE, F.R.S., P.E.S.

[Read 5th August, 1844.]

IN my late visit to the Continent, besides amassing a rich collection of recent insects, my attention was also directed to those which for some period or periods have been entombed in a fossil state. The major part were obtained at Aix in Provence, and at Sinigaglia in Italy.

It is not my intention at present to describe any of the latter formation, and I only at present figure three from the former locality, being doubtful if they will interest the Entomological Society equally as much as existing and recent species.

Little I believe has been written on the fossil insects of Aix, excepting a memoir by Marcel de Serres\* and Mr. Murchison, and some notices by Mr. J. Curtis, published in 1831 or 1832. Heinrich Georg Bronn, in his "Lethæa Geognostica," † (published in 1838,) gives in his second volume a catalogue of the genera which have been discovered at Aix; and as it is a work little known to many of us, I insert the list of names there published, adding the letter B to designate those with which he was acquainted, and the letter H to particularize those which have fallen under my inspection.

COLEOPTERA.

|   | GENERA.                         |   | Remarks.   |
|---|---------------------------------|---|--|
| 1 | <i>Harpalus</i> , B. & H. †..   | 1 | An insect resembling <i>Harpalus ruficornis</i> , only smaller.  |
| 2 | <i>Helobia</i> , H.....         | 2 | The elytra closely resemble that genus.  |
| 3 | <i>Dyticus</i> , B. ....        | 3 |  |
| 4 | <i>Colymbetes</i> , H. ....     | 4 | An insect similar to <i>C. striatus</i> , and I have seen some specimens resembling <i>Hiphidrus</i> . |
| 5 | <i>Hydrobius</i> , B. & H. ..   | 5 | Some specimens are closely allied to <i>H. fuscipes</i> .  |
| 6 | <i>Staphylinus</i> , B. & H. .. | 6 | Apparently three distinct genera.  |
| 7 | <i>Lathrobium</i> , B. ....     | 7 |  |
| 8 | <i>Sisyphus</i> , B. ....       | 8 |  |
| 9 | <i>Pachypus</i> , B. ....       | 9 |  |

\* Marcel de Serres mentions 62 genera of Insects; vide "Géolog. des Tertiaires du Midi de la France."

† "Lethæa Geognostica, von Heinrich Georg Bronn," in 2 vols. 8vo. published in 1838.

‡ B. alludes to the species mentioned in Bronn's Catalogue, and H. those which have fallen under the inspection of Mr. Hope.

COLEOPTERA—continued.

| GENERA. |                                    | Remarks.  |
|---------|------------------------------------|---|
| 10      | <i>Geotrupes?</i> H. . . . .       | 10  |
| 11      | <i>Melolontha</i> , B. & H. . .    | 11 Single elytra, chiefly like <i>Rhisotrogus</i> .                                     |
| 12      | <i>Cetonia</i> , B. . . . .        | 12 I heard of some examples, but never saw a specimen.                                  |
| 13      | <i>Buprestis</i> , B. & H. . . . . | 13 Small, with acuminate elytra.  |
| 14      | <i>Elater</i> , H. . . . .         | 14 One <i>Elater</i> allied to <i>niger</i> ; two distinct species.                     |
| 15      | <i>Atopa</i> , H. . . . .          | 15 Probably <i>Atopa cervina</i> , only darker.   |
| 16      | <i>Ptinus</i> , B. . . . .         | 16 Unseen by me.  |
| 17      | <i>Sepidium</i> , B. . . . .       | 17 Elytra similar certainly, and yet I doubt the genus.                                 |
| 18      | <i>Opatrum</i> , B. & H. . . . .   | 18 Not uncommon; one species is elongated and small.                                    |
| 19      | <i>Asida</i> , B. & H. . . . .     | 19 Probably two or three species.   |
| 20      | <i>Bruchus</i> , B. . . . .        | 20  |
| 21      | <i>Apion</i> , B. . . . .          | 21  |
| 22      | <i>Rhynchites</i> , H. . . . .     | 22 A dark species.  |
| 23      | <i>Sitona</i> , B. . . . .         | 23  |
| 24      | <i>Lixus</i> , H. . . . .          | 24 Several; they vary much in size.   |
| 25      | <i>Cleonis</i> , B. & H. . . . .   | 25  |
| 26      | <i>Balaninus</i> , H. . . . .      | 26 Very fine; one figured.  |
| 27      | <i>Cionus</i> , B. . . . .         | 27  |
| 28      | <i>Brachycerus</i> , B. & H. . .   | 28 A species approaching an African form; at least I know no European species like it.  |
| 29      | <i>Rhynchænus</i> , H. . . . .     | 29  |
| 30      | <i>Meleus</i> , B. . . . .         | 30  |
| 31      | <i>Hypera</i> , B. & H. . . . .    | 31  |
| 32      | <i>Naupactus</i> , B. . . . .      | 32  |
| 33      | <i>Rhinobatus</i> , B. & H. . .    | 33 Allied to <i>Cynara</i> , but smaller.   |
| 34      | <i>Dorytomus</i> , B. . . . .      | 34  |
| 35      | <i>Apate</i> , B. & H. . . . .     | 35  |
| 36      | <i>Scolytus</i> , B. & H. . . . .  | 36 In colour like recent insects.   |
| 37      | <i>Hylurgus</i> , B. . . . .       | 37 Probably a genus allied to <i>Hylurgus</i> .   |
| 38      | <i>Bostrichus</i> , H. . . . .     | 38 Dark, sometimes pitchy.  |
| 39      | <i>Trogosita</i> , B. & H. . . . . | 39 A form very similar; ferruginous; one very perfect.                                  |
| 40      | <i>Ips</i> , B. . . . .            | 40  |
| 41      | <i>Callidium</i> , B. . . . .      | 41 I saw three specimens of some longicornus, but too imperfect to make out the genera. |
| 42      | <i>Cassida</i> , B. & H. . . . .   | 42 The species is very small.   |
| 43      | <i>Chrysomela</i> , B. & H. . .    | 43 Three or four species, one deeply punctured.   |
| 44      | <i>Coccinella</i> , H. . . . .     | 44 One with four black guttæ.   |

ORTHOPTERA.

|    |                                    |  |
|----|------------------------------------|--|
| 45 | <i>Forficula</i> , B. & H. . . . . | 45 Only the forceps.                       |
| 46 | <i>Gryllus</i> , B. & H. . . . .   | 46 Legs and wings.                         |
| 47 | <i>Gryllotalpa</i> , B. . . . .    | 47   |
| 48 | <i>Acheta</i> , B. & H. . . . .    | 48 Much injured; several species probably. |
| 49 | <i>Locustæ</i> , B. & H. . . . .   | 49   |
| 50 | <i>Tridactylus</i> , B. . . . .    | 50   |

HYMENOPTERA.

|    |   |    |
|----|---|----|
| 51 | <i>Tenthredo</i> ( <i>Selandria</i> ), B. | 51 |
| 52 | <i>Pimpla</i> , B. . . . .                | 52 |
| 53 | <i>Ichneumon</i> , B. & H. . .            | 53 |
| 54 | <i>Cryptus</i> , B. . . . .               | 54 |

## HYMENOPTERA—continued.

| GENERA. |                                | Remarks.                                    |
|---------|--------------------------------|---|
| 55      | <i>Agathis</i> , B. . . . .    | 55  |
| 56      | <i>Anomalon</i> , B. & H. . .  | 56  |
| 57      | <i>Ophion</i> , B. . . . .     | 57  |
| 58      | <i>Polistes</i> , B. . . . .   | 58  |
| 59      | <i>Vespa</i> , H. . . . .      | 59  |
| 60      | <i>Formica</i> , B. & H. . . . | 60  |
| 61      | <i>Chalcididæ</i> , H. . . . . | 61  |
|         |                                | I met with three specimens.                 |
|         |                                | A <i>Vespa</i> , if not a <i>Polistes</i> . |
|         |                                | A dark species.                             |
|         |                                | Several.                                    |

## NEUROPTERA.

|    |  |    |                                 |
|----|--|----|---------------------------------|
| 62 | <i>Libellula</i> , B. & H. . . .         | 62 | Wings of more species than one. |
| 63 | <i>Agrion</i> , H. . . . .               | 63 |                                 |
| 64 | <i>Phryganea</i> (and larvæ),<br>B. & H. | 64 |                                 |

## HEMIPTERA.

|    |                                 |    |  |
|----|---------------------------------|----|--|
| 65 | <i>Pentatoma</i> , B. & H. . .  | 65 | Several species.                                 |
| 66 | <i>Coreus</i> , B. & H. . . . . | 66 | Apparently three species, one black.             |
| 67 | <i>Lygaeus</i> , B. & H. . . .  | 67 | Several species.                                 |
| 68 | <i>Miris</i> , B. . . . .       | 68 |  |
| 69 | <i>Syrtsis</i> , B. . . . .     | 69 |  |
| 70 | <i>Tingis</i> , B. & H. . . . . | 70 | Somewhat resembling <i>Cardui</i> .              |
| 71 | <i>Aradus</i> , B. & H. . . .   | 71 | Closely like <i>Corticalis</i> .                 |
| 72 | <i>Corizus</i> , Hope . . . . . | 72 | One figured.                                     |
| 73 | <i>Reduvius</i> , B. & H. . .   | 73 | Certainly different species, if not genera also. |
| 74 | <i>Ploiaria</i> , B. . . . .    | 74 |  |
| 75 | <i>Gerris</i> , B. & H. . . . . | 75 | <i>Gerris</i> ?                                  |
| 76 | <i>Notonecta</i> , H. . . . .   | 76 | A small species, nearly white.                   |
| 77 | <i>Nepa</i> , B. . . . .        | 77 |  |
| 78 | <i>Ranatra</i> , H. ? . . . . . | 78 | A form resembling <i>Ranatra</i> .               |
| 79 | <i>Cicada</i> , B.—H. ? . . .   | 79 |  |
| 80 | <i>Delphax</i> , B. ? . . . . . | 80 |  |
| 81 | <i>Cercopis</i> , B. . . . .    | 81 |  |
| 82 | <i>Tettigonia</i> , B. . . . .  | 82 |  |
| 83 | <i>Thrips</i> , B. . . . .      | 83 |  |
| 84 | <i>Aphis</i> , B. & H. . . . .  | 84 | A mass of insects resembling <i>Aphida</i> .     |

## LEPIDOPTERA.

|    |                                 |    |                                     |
|----|---------------------------------|----|-------------------------------------|
| 85 | <i>Satyrus</i> , B. . . . .     | 85 |                                     |
| 86 | <i>Zygana</i> , B. . . . .      | 86 |                                     |
| 87 | <i>Sesia</i> , B. . . . .       | 87 |                                     |
| 88 | <i>Bombyx</i> , B. & H. ? . . . | 88 | Part of a wing of a <i>Bombyx</i> . |

## DIPTERA.

|    |                                  |    |                          |
|----|----------------------------------|----|--------------------------|
| 89 | <i>Mycetophila</i> , B. & H. . . | 89 | Wings expanded.          |
| 90 | <i>Rhingia</i> , H. . . . .      | 90 |                          |
| 91 | <i>Bibio</i> ? H. ? B. . . . .   | 91 |                          |
| 92 | <i>Hirtæa</i> , B. & H. . . . .  | 92 | <i>Hirtæa</i> in copula. |
| 93 | <i>Tabanus</i> , B. & H. . . .   | 93 | A black species.         |
| 94 | <i>Sargus</i> , B.—H. ? . . . .  | 94 |                          |
| 95 | <i>Ceratopogon</i> , B. & H. . . | 95 |                          |
| 96 | <i>Nephrotoma</i> , B. . . . .   | 96 |                          |
| 97 | <i>Linnobia</i> , B. & H. . . .  | 97 | Very perfect.            |
| 98 | <i>Corethra</i> , H. . . . .     | 98 |                          |

## DIPTERA—continued.

| GENERA. |                                    | Remarks.                                   |
|---------|------------------------------------|--|
| 99      | <i>Trichocera</i> , B. . . . .     | 99 Very delicate.                          |
| 100     | <i>Platyura</i> , B. . . . .       | 100  |
| 101     | <i>Sciara</i> , B. . . . .         | 101  |
| 102     | <i>Scatops</i> , B. & H. . . . .   | 102  |
| 103     | <i>Penthetria</i> , B. . . . .     | 103  |
| 104     | <i>Dilophus</i> , B. . . . .       | 104  |
| 105     | <i>Anisopus</i> , B. . . . .       | 105  |
| 106     | <i>Asilus</i> , B.—H. ? . . . .    | 106 Most likely part of an <i>Asilus</i> . |
| 107     | <i>Empis</i> , B. & H. . . . .     | 107  |
| 108     | <i>Nemestrina</i> , B. . . . .     | 108  |
| 109     | <i>Xylophagus</i> , B. . . . .     | 109  |
| 110     | <i>Orycera</i> , B. . . . .        | 110  |
| 111     | <i>Nemotelus</i> , B. & H. . . . . | 111  |
| 112     | <i>Aphritis</i> , B. . . . .       | 112  |
| 113     | <i>Tipula</i> , H. ? . . . . .     | 113 A species allied to <i>rivosa</i> .    |

In addition to the 113 genera given in the above tables, many others might easily be mentioned, and when all the specimens I collected reach this country the catalogue will be considerably increased. Amongst the *Arachnida* I have noticed an elongated species of *Chelifera*, and in the *Myriapoda*, *Julus* and *Scolopendra*; in *Insecta*, there are about twenty genera added, hitherto I believe unnoticed by any individual; and from the numerous specimens in the hands of geologists and others, many more may yet be expected to occur.

Before I attempt to describe the few species I have had figured, I must refer the Entomologist, for an account of the formation of Aix, to the writings of Murchison, Philips and Lyell. Some few remarks, derived from persons living on the spot, are also added. As my intended cicerone, in a visit to the fossil beds, was a medical man, and happened to be called away on more important matters than hunting for fossils, I had not during my stay another opportunity of visiting the spot myself, and therefore I was obliged to commit to paper the few observations I gleaned from my friends in conversation.

The fossil insects are generally found in two laminated beds, each stratum rarely exceeding two inches in thickness, the stone itself looking like that which is commonly used in lithography; a third bed is also reported to have been discovered, but as it is not equally rich in specimens as the two uppermost beds, much attention has not been bestowed upon it. Each of the above seams (if that word may be used) is composed of various thin laminae,

differing in thickness, and on their surface the major part of the insects are imbedded. Of the various specimens of rock which I examined and split into laminae, the two upper appeared to contain a much larger proportion of insects than the remainder, and the second from the top afforded generally specimens of plants half carbonized; some of the fossil insects were also of a ferruginous and ochreous colour. Terrestrial and aquatic species are mingled together. Some of the *Coleoptera* are frequently without their antennae, femora and tarsi, and appear, from their contorted position and mutilation of limbs, to have struggled hard to avoid their inhumation. The *Diptera*, on the contrary, which are amongst the most elegant fossils known, seem to be uninjured, and in great perfection; indeed it is difficult to imagine how such delicately attenuated fragile forms (with limbs scarcely thicker than gossamer silk) are found in any state of preservation. The presence of the genera *Limnobia*, *Corcthra*, *Trichocera* and *Tipula*, lead one to the conclusion that the waters, if they carried the insects down in their course, must have very gradually and gently subsided. I cannot help thinking, from the perfect state in which many of them appear, that the insects (as the waters were absorbed) settled on the slimy deposit, and instantly became enveloped: another flood would bring down an increase of sediment, and cover the insects entirely; in such a way apparently the different laminae were formed, and the insects preserved. In concluding these remarks I have only to add, that if the present paper is thought worthy of the attention of the Society, I shall have some other opportunities of adding to these observations, and give also some account of the fossil insects of Sinigaglia, a locality nearly as rich as Aix, but one which, from inquiries, seems to be scarcely known in England.

#### DESCRIPTIONS OF THREE FOSSIL SPECIES OF INSECTS.

Sp. 1. *Balaninus Barthelemyi*, Hope. Aix.

(Pl. XIX. fig. 1.)

Faunicolor, rostro crasso, subtilissime punctato, thorace convexo, confertissime tuberculato, tuberculis rotundatis, elytrisque striato-sulcatis, striis punctis elevatis serie dispositis.

Long. lin.  $4\frac{1}{2}$ , lat. lin.  $1\frac{3}{4}$ .

The above specimen was given me by Monsieur Barthelemy of Marseilles; it is named in honour of that zealous naturalist. It appears, from the state of the proboscis and fragments of the femora, to have suffered much from abrasion. In colour it closely resembles some recent species still found in the vicinity of Aix.

